

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1 to 4 (Canceled)

5. (Original) A staphylococcal alpha hemolysin (α HL) polypeptide comprising at least two non-consecutive heterologous amino acids in a stem domain of said polypeptide, wherein each of said heterologous amino acids binds a metal.

6. (Original) The polypeptide of claim 5, wherein said amino acids occupy two or more of the following positions of SEQ ID NO: 1: 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147 or 149.

7. (Original) The polypeptide of claim 5, wherein said amino acids occupy two or more of the following positions of SEQ ID NO: 1: 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148.

8. (Original) The polypeptide of claim 5, wherein said polypeptide comprises at least three non-consecutive heterologous amino acids in the stem domain of said polypeptide.

9. (Original) The polypeptide of claim 5, wherein said polypeptide comprises at least 4 non-consecutive heterologous amino acids in the stem domain of said polypeptide.

10. (Original) The polypeptide of claim 9, wherein said amino acids occupy positions 123, 125, 133, and 135 of SEQ ID NO: 1.

11. (Original) The polypeptide of claim 10, wherein said polypeptide is 4H.

12. (Presently Amended) A mutant staphylococcal alpha hemolysin polypeptide comprising a heterologous amino acid, wherein the heterologous amino acid binds an analyte and wherein the polypeptide assembles into a heteroheptameric pore assembly in the presence of a plurality of wild type staphylococcal alpha hemolysin polypeptides ~~The polypeptide of claim 1,~~ and wherein said the amino acid is selected from the group consisting of Ser, Thr, Met, Trp, and Tyr.

13. (Presently Amended) A mutant staphylococcal alpha hemolysin polypeptide comprising a heterologous amino acid, wherein the heterologous amino acid binds an analyte and wherein the polypeptide assembles into a heteroheptameric pore assembly in the presence of a plurality of wild type staphylococcal alpha hemolysin polypeptides ~~The polypeptide of claim 12,~~ and wherein said the amino acid is selected from the group consisting of Glu, Asp, Cys, His.

14. (Original) The polypeptide of claim 13, wherein said amino acid is His.

15. (Original) A staphylococcal alpha hemolysin (α HL) polypeptide comprising at least two non-consecutive heterologous amino acids in a stem domain of said polypeptide, wherein each of said heterologous amino acids binds an organic molecule.

16. (Original) The polypeptide of claim 15, wherein said organic molecule is an explosive.

17. (Original) The polypeptide of claim 15, wherein said amino acids occupy two or more of the following positions of SEQ ID NO: 1: 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147 or 149.

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18. (Original) The polypeptide of claim 16, wherein said polypeptide is 123W/125W.

19. (Presently Amended) The polypeptide of claim 15 ~~1~~, wherein said polypeptide further comprises a third ~~second~~ heterologous amino acid at a site distant from said stem domain.

20. (Presently Amended) The polypeptide of claim 19, wherein said third ~~second~~ heterologous amino acid is a Cys residue at position 292 of SEQ ID NO: 1.

21 to 25 (Canceled)

26. (Presently Amended) A heptomeric pore assembly comprising a mutated staphylococcal α HL polypeptide (MUT), wherein the MUT ~~The pore assembly of claim 21, wherein said analyte-binding α HL polypeptide is 123W/125W.~~

27 to 29 (Canceled)

30. (Presently Amended) A digital biosensor device comprising a heptomeric pore assembly comprising a mutated staphylococcal α HL polypeptide (MUT), wherein the MUT is an analyte-binding α HL polypeptide comprising ~~The device of claim 29, wherein said analyte-binding α HL polypeptide comprises~~ at least two nonconsecutive heterologous amino acids in the stem domain of the polypeptide, wherein each of said the heterologous amino acids binds a metal.

31. (Presently Amended) A digital biosensor device comprising a heptomeric pore assembly comprising a mutated staphylococcal α HL polypeptide (MUT), wherein the MUT is an analyte-binding α HL polypeptide comprising ~~The device of claim 29, wherein said analyte-~~

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~~binding α HL polypeptide~~ comprises a chelating molecule in the stem domain of said ~~the~~
polypeptide.

32. (Presently Amended) The device of claim 30 ~~29~~, wherein said device detects binding of a metal ion to said analyte-binding α HL polypeptide.

33. (Original) The device of claim 32, wherein said device detects a single channel current.

34. (Original) The device of claim 32, wherein said device detects a current through two or more channels

35 to 45 (Canceled)

46. (New) The device of claim 31, wherein said device detects binding of a metal ion to said analyte-binding α HL polypeptide.

47. (New) The device of claim 46, wherein said device detects a single channel current.

48. (New) The device of claim 46, wherein said device detects a current through two or more channels
